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[54] 发明名称 含银纺织品的制备方法

[57] 摘要

本发明涉及 $H_4Ag_2O_6$ 的溶液的用途，具体地说，涉及一种具有抗菌性能的含银的纺织品的简化的制备方法。本发明的方法包括以下步骤：1）制备得到含 $H_4Ag_2O_6$ 的溶液；2）用所得到的 $H_4Ag_2O_6$ 溶液浸渍、淋洗、喷射或涂敷纺织品；然后 3）干燥该湿纺织品。用本发明的方法极大地简化了生产工艺，从而扩大了生产能力，节省了生产成本。

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1、$H_4Ag_2O_6$ 溶液在制造含银抗菌纺织品中的应用。

2、如权利要求 1 所述的应用，其特征在于所述纺织品是针织物、机织物、无纺织物、纱线或网膜。

3、如权利要求 1 所述的应用，其特征在于所述纺织品是天然纺织品、合成纺织品或它们的混合物。

4、如权利要求 3 所述的应用，其特征在于所述天然纺织品是棉、毛、麻、丝、甲壳胺或其混纺织品；所述合成纺织品包括聚酯、尼龙、聚乙烯以及醋酯纤维或它们的混纺织品。

5、如权利要求 1 所述的应用，其特征在于所述纺织品是全棉无纺布。

6、如权利要求 1 所述的应用，其特征在于所述纺织品是纱布。

7、如权利要求 1 所述的应用，其特征在于所述纺织品是纱线。

8、如权利要求 1 所述的应用，其特征在于所述纺织品是网膜。

9、一种制造含银纺织品的方法，该方法包括：

1）制备得到含 $H_4Ag_2O_6$ 的溶液；

2）用所得到的 $H_4Ag_2O_6$ 溶液浸渍、淋洗、喷射或涂敷纺织品；和

3）干燥该湿纺织品。

10、如权利要求 8 所述的方法，其特征在于所述 $H_4Ag_2O_6$ 的溶液的浓度为 1-5000ppm。

11、如权利要求 8 所述的方法，干燥烘干温度为 50℃－250℃，时 间为 2 分钟－30 分钟。

12、如权利要求 8 所述的方法，其特征在于可以采用日光或紫外线照射进行干燥。

13、如权利要求 8 所述的方法，其特征在于所述纺织品是针织物、机织物无纺织物、纱线或网膜。

14、如权利要求 8 所述的方法，其特征在于所述纺织品是天然纺织品、合成纺织品或它们的混合物。

15、如权利要求 13 所述的方法，其特征在于所述天然纺织品是棉、毛、麻、丝或其混纺织品；所述合成纺织品包括粘胶、聚酯、尼龙、聚乙烯以及醋酯纤维或它们的混纺织品。

16、如权利要求 8 所述的方法，其特征在于所述纺织品是全棉无纺布。

17、如权利要求 8 所述的方法，其特征在于所述纺织品是纱布。

18、如权利要求 8 所述的方法，其特征在于所述纺织品是纱线。

19、如权利要求 8 所述的方法，其特征在于所述纺织品是网膜。

20、一种用权利要求 8 所述的方法制造的含银抗菌纺织品。

含银纺织品的制备方法

发明领域

本发明涉及 $H_4Ag_2O_6$ 溶液的用途，具体地说，涉及其在生产含银抗菌纺织品中的应用。本发明还涉及一种含银抗菌纺织品的简化的制备方法。

背景技术

具有抗菌性能的含银纺织品在现有技术中是一种公知的产品。在本领域中，有多种制备含银纺织品的方法，但绝大多数是利用还原剂将硝酸银还原成单质银，然后再利用氧化剂将还原的单质银，或进一步将银氧化成氧化银。例如，蒋建华的中国专利 CN1034090C 公开了一种长效广谱抗菌织物的制造方法，该方法包括将硝酸银溶于氨水中，再加入葡萄糖还原，然后利用高温至织物出现褐黑色和黄褐色表面。朱红军等的国际申请 WO03/14627 公开了一种防集聚纳米银抗菌纺织品及其制备方法，该方法是将硝酸银溶于氨水中得到 $[Ag(NH_3)_2]^+$，再用还原剂将 $[Ag(NH_3)_2]^+$ 还原成单质银固定在织物上，然后用氧化剂进一步将含银织物氧化以得到含银抗菌织物。

刘祥文的中国专利申请 CN1395828A 公开了一种纳米银抗菌微粒实地快速组装方法，其是将硝酸银直接喷洒或涂刷于织物表面，经还原剂或光照处理得到抗菌含银织物。

美国专利 US6436420B1 公开了一种制备含银织物的方法，该方法是将织物浸渍在含有溶解的硝酸银的水溶液中，浸渍一段时间后，取出该织物，并将其浸渍于热的含氢氧化钠和过硫酸钠的水溶液中，再将溶液加热到 95-100℃，由此得到所需的含银织物。该方法是通过两次浸渍，第一次浸渍是使一价银离子浸入织物的纤维之间或沉积于纤维上，第二次浸渍是通过将一价银离子氧化成过氧化银(Ag_4O_4)，以使织物含有过氧化银而具有抗菌性。

已转让给本申请人的中国专利申请 CN1214867A 公开了一种含银杀

菌剂的制备方法，该方法包括以下步骤：1）取银的氧化物，加入蒸馏水；2）搅拌 15-60 分钟后，逐滴加入浓酸，以使 pH 值为 2-3.5；3）澄清至少 2 小时，倒出澄清液；4）向沉淀物中加入过氧化氢，则得到含 $H_4Ag_2O_6$ 的杀菌剂。该方法的特点是以银的氧化物，例如氧化银或过氧化银为原料，而不是通常所使用的硝酸银，这样就避免了将银离子还原成单质银的步骤。

发明内容

本发明正是基于中国专利申请 CN1214867A 所得的杀菌剂的用途。本发明利用含 $H_4Ag_2O_6$ 的杀菌剂制备含银的抗菌织物，大大简化了工艺流程，从而节约了生产成本。因此，本发明的一个目的是提供含 $H_4Ag_2O_6$ 的杀菌剂的应用，更具体地说，本发明的目的是提供一种简化的生产含银抗菌纺织品的方法。本发明方法避免了高温氧化带来的一系列的弊病，大大节省了能源，因此，使生产成本降低。

因此，本发明提供了一种含银纺织品的制备方法，该方法包括以下步骤：

1）制备得到含 $H_4Ag_2O_6$ 的溶液；

2）用所得到的 $H_4Ag_2O_6$ 溶液浸渍、淋洗、喷射或涂敷纺织品；然后

3）干燥该湿纺织品。

具体实施方式

一方面，本发明涉及高价银离子溶液的应用。本发明的高价银离子溶液是 $H_4Ag_2O_6$ 溶液，其中，银离子是正四价氧化态。该溶液的一种制备方法已公开在中国专利申请 CN1214867A 上。其是以银的氧化物，例如氧化银或过氧化银作为原料，在酸性介质中加入过氧化氢而得到的，所得溶液中银离子的总含量为 1-5000ppm。此外，高价银离子溶液还可以通过将氧化银溶解于过硫酸盐中而得到，所得溶液中银离子的总含量为 1-500ppm，此方法公开在中国专利申请 CN1149389A 中。由以上两种方法得到的高价银离子溶液都可以用于本发明中。

以下步骤：

1）制备得到含 $H_4Ag_2O_6$ 的溶液；

2）用所得到的 $H_4Ag_2O_6$ 溶液浸渍、淋洗、喷射或涂敷纺织品；和

3）干燥该湿纺织品。

在本发明方法中，可以使用的纺织品包括天然纺织材料和合成纺织材料。可用于本发明的天然纺织材料可以是棉、毛、麻和丝，优选为棉，例如纱布、纱线、全棉无纺布等。可用于本发明的合成纺织材料是指合成纤维，即一种人造纤维，包括但并不局限于聚酯、尼龙、聚乙烯以及醋酯纤维等，可以单独使用其中的一种，也可以使用上述产品的混纺织品，可以是织物形式，也可以是纤维、纱线或网膜形式。本发明所用的纺织品可以是针织物、机织物、无纺织物或纱线。

在本发明方法中，用 $H_4Ag_2O_6$ 溶液浸渍、淋洗、喷射或涂敷纺织品。所用的方法是本领域常规的方法。然后使润湿的纺织品干燥。用 $H_4Ag_2O_6$ 溶液浸渍、淋洗、喷射或涂敷纺织品的时间，根据纺织品类型的不同而不同。例如，如果是吸水性好的全棉纺织品，其浸渍时间可以很短，仅 1 秒钟即可，而对于粘胶等吸水性差的合成纤维，浸渍时间则要长些，可以是 30 秒以上。干燥的方法可以采用本领域常的方法，一般在 50—250℃ 下干燥，也可以直接用日光照射或用紫外线辐照。

用本发明方法可以通过控制高价银离子溶液的银离子浓度来控制纺织品的银含量。由本发明方法所得纺织品的银含量可高达 120μg/cm^2。具体的银含量还取决于纺织品的类型，例如取决于织物编织的松紧度，或是否是天然织物还是合成织物。

实施例

以下通过实施例具体说明本发明。

实施例 1

按照 CN1214867A 的方法制备 $H_4Ag_2O_6$ 溶液，使得到的溶液中的银离子浓度为 1000ppm。在室温下，取一块 38g/m^2 全棉无纺布，使之浸于上述溶液中 5 分钟后取出，然后在 50℃ 下干燥该含银全棉无纺布。测得全棉无纺布上的银含量为 36.5 μg/cm^2。

实施例 2

按照与实施例 1 相同的方法制备含银全棉无纺布，不同的是 $H_4Ag_2O_6$ 溶液的浓度为 3000 ppm。测得全棉无纺布上的银含量为 75.8 μg/cm²。

实施例 3

按照与实施例 1 相同的方法制备含银全棉无纺布，不同的是 $H_4Ag_2O_6$ 溶液的浓度为 4000 ppm。测得全棉无纺布上的银含量为 86.8 μg/cm²。

实施例 4

按照 CN1149389A 的方法制备 $H_4Ag_2O_6$ 溶液，使得到的溶液中的银离子浓度为 500ppm。在室温下，取一块全棉无纺布，使之浸于上述溶液中 30 秒钟后取出，然后在 50℃下干燥该含银全棉无纺布。测得全棉无纺布上的银含量为 16.7μg/cm²。

实施例 5

按照 CN1149389A 的方法制备 $H_4Ag_2O_6$ 溶液，使得到的溶液中的银离子浓度为 500ppm。在室温下，取一块全棉无纺布，用上述溶液淋洗 1 分钟后取出，然后在 50℃下干燥该含银全棉无纺布。测得全棉无纺布上的银含量为 17.0 μg/cm²。

实施例 6

按照 CN1149389A 的方法制备 $H_4Ag_2O_6$ 溶液，使得到的溶液中的银离子浓度为 500ppm。在室温下，取一块全棉无纺布，用上述溶液淋洗 5 分钟后取出，然后在 50℃下干燥该含银全棉无纺布。测得全棉无纺布上的银含量为 17.6 μg/cm²。

实施例 7-9

按照与实施例 4 相同的方法制备实施例 7-9 的含银全棉无纺布，不同的是 $H_4Ag_2O_6$ 溶液的浓度为 50 ppm。全棉无纺布浸渍时间分别为 30 秒、1 分钟和 5 分钟。测得全棉无纺布上的银含量分别为 4.8 μg/cm²、

实施例 10-11

按照与实施例 1 相同的方法制备实施例 10-11 的含银全棉无纺布，不同的是 $H_4Ag_2O_6$ 溶液的浓度为 20 ppm。全棉无纺布浸渍时间分别为 1 分钟和 5 分钟。测得全棉无纺布上的银含量分别为 2.3 $\mu g/cm^2$、2.6 $\mu g/cm^2$ 。

实施例 12

按照 CN1149389A 的方法制备 H4aG2O6 溶液，稀释使溶液中的银离子浓度为 500pm。在室温下，取一块粘胶无纺布，在溶液中浸泡 1 分钟后取出，经挤压后，在 170° 干燥烘干得到含银粘胶无纺布，其含银量为 18.2 $\mu g/cm^2$。

实施例 13

与实施例 5 相同，以粘胶/PET 混纺无纺布代替全粘胶无纺布，所得含银粘混纺无纺布含银量为 18.9 $\mu g/cm^2$。

实施例 14

与实施例 5 相同，以纱布代替全面无纺布，所得含银纱布银含量为 8.5 $\mu g/cm^2$。

实施例 15

与实施例 5 相同，取一块全面无纺布，在溶液中浸泡 1 分钟取出，经挤压后，光照 4 小时，其含银量为 16.1 $\mu g/cm^2$。

实验例

用实施例 1-12 的样品和空白样品按照 AATCC 试验方法 100-1999 进行抑菌率的实验。检测用细菌为金黄色葡萄球菌。抑菌率的计算方法如下：

抑菌率=[（C-A）/C]×100%

其中：A 表示含药样品接种后培养 24 小时后的细菌数；C 表示空白样品接种后“0”接触时间的活菌数。

棉空白对照样品接种后培养 24 小时的活菌数为 4.5×10^8 个，接种“0”接触时间的活菌数为 6.8×10^7 个，前者是后者的 6.6 倍。表 1 给出了本发明实验结果。

表 1

样品	溶液浓度 ppm	浸渍时间	每块样品活菌数	24 小时抑菌率
棉空白“0”接触	--	--	6.8×10^7	
棉空白培养 24 小时	--	--	4.5×10^8	
实施例 1	1000	5 分	36000	99.95%
实施例 2	3000	5 分	8000	99.99%
实施例 3	4000	5 分	346000	99.49%
实施例 4	500	30 秒	1420000	97.91%
实施例 5	500	1 分	60000	99.91%
实施例 6	500	5 分	0	100%
实施例 7	50	30 秒	110000	99.84%
实施例 8	50	1 分	686000	98.99%
实施例 9	50	5 分	0	100%
实施例 10	20	1 分	4000	>99.99%
实施例 11	20	5 分	22000	99.97%
实施例 12	500	1 分	97000	99.65%
实施例 13	500	1 分	4000	99.99%
实施例 14	500	1 分	4000	99.99%
实施例 15	500	1 分	4000	99.99%

从实验结果可以看出，由本发明方法生产的含银抗菌织物具有良好的抗菌性能。由此可以得出结论，用本发明方法可以生产出含银抗菌纺织品。

Preparation Method of Silver Containing Textile

Area of invention

This invention relates to applications of solutions H4Ag2O6, specifically, relates to its application in the manufacturing of silver containing antimicrobial textiles. This invention also relates to a simplified method of making of silver containing antimicrobial textiles.

Background

Silver containing textiles processing antimicrobial activities are well known products among current technologies. There are many methods of making silver containing textiles. However, most of these methods involve the reduction of silver nitrate to silver, followed by the oxidation of the reduced silver to silver oxide. For example, CN1034090C disclosed a manufacturing method of a long lasting, broad-spectrum antimicrobial textiles. This method involves dissolving silver nitrate in aqueous ammonia to obtain [Ag(NH3)2]+, reducing [Ag(NH3)2]+ to silver and fixing it on textiles, then oxidizing the silver containing textile to obtain silver containing antimicrobial textiles.

CN1395828A (Liu) disclosed an in situ quick assembling method for nano silver antimicrobial particles. It used direct spraying or painting of silver nitrate onto the surface of textiles, followed by reducing or light exposure treatment to obtain antimicrobial silver containing textiles.

US6436420B1 disclosed a manufacturing method of silver containing textiles. In this method, textiles were soaked in aqueous solution containing dissolved silver nitrate. Textiles were taken out, then soaked in warm aqueous solution containing sodium hydroxide and sodium persulfate. The solution was heated to 95-100 C to obtain silver containing textiles. The method involves two soaking processes. In the first soaking, silver ions (I) were soaked between fibers or precipitated on the fibers; in the second soaking, Ag(I) was oxidized to silver peroxide (Ag4O4). The textiles contained silver peroxide and therefore possesses antimicrobial activities.

CN1214867A which has been licensed to the applicant of this invention disclosed a manufacturing method for silver containing bactericide. In involved the following steps:
I. Distilled water was added oxide(s) of silver;
II. After stirring for 15~60 min, concentrated acid was added drop wise, till the pH value reached 2 ~ 3.5;
III. The solution was clarified for at least 2 hours, and the clarified solution was decanted;
IV. Hydrogen peroxide was added to the precipitate to obtain bactericidal agents containing H4Ag2O6. Other than commonly used silver nitrate, this method used oxides of silver, such as silver oxide or silver peroxide. Therefore, it avoided the step of reducing silver ions to silver.

Body of invention

This invention is based on the application of the bactericide obtained through CN1214867A. This invention used H4Ag2O6 containing bactericide to prepare silver containing textiles, greatly simplified the process, resulting in savings of manufacturing cost. Therefore, one purpose of this invention is to provide applications of H4Ag2O6

containing bactericide. More specifically, the purpose of this invention is to provide a simplified manufacturing method of silver containing antimicrobial textiles. This method eliminated a serious of disadvantages associated with high temperature oxidation and reduced cost by saving energy.

In summary, this invention provided a manufacturing method for silver containing textiles. The method involved the following steps:

1. preparing solutions containing H4Ag2O6;
2. soaking, raising, spraying, or coating so obtained H4Ag2O6 solutions on textiles; then
3. trying the wet textiles.

Implementation of the invention

This invention involves applications of solutions of high valence silver ions. The high valence silver ion solution in this invention is that of H4Ag2O6, where silver ion is plus for valence. One method of preparing such solutions was disclosed in CN1214867A. The method used oxides of silver, such as silver oxide or silver peroxide as starting materials, adding hydrogen peroxide into acidic medium to obtain the solution. Total silver ion content in the solution is 1-5000 ppm. High valence silver ion solutions can also be obtained by dissolving silver oxide in persulfate salts. The total silver ion content in so obtained solution is 1-500 ppm. Such method was disclosed in CN1149389A. High silver ion solution obtained from either of these to methods can be used in this invention.

This invention related to a manufacturing method for silver containing textiles. The invention involved the following steps:

1. preparing solutions containing H4Ag2O6;
2. soaking, raising, spraying, or coating so obtained H4Ag2O6 solutions on textiles; then
3. drying the wet textiles.

Textiles suitable for this invention include natural textile and synthetic textiles. Suitable natural textiles may be cotton, linen, wool, and silk. Preferred textiles are cotton, such as gauze, yarn, cotton nonwowen, etc. Suitable synthetic textiles are synthetic fibers, i.e. man made fibers, including but not limiting polyester, nylon, poly ethylene, and cellulous acetate, etc. The textile can be a single material, or mixtures of them. The textile can be in any of the forms of finished materials, fibers, yarns, or punctured membranes.

In this invention, textiles were soaked, raised, sprayed, or coated with H4Ag2O6 solutions using routing processes in the filed. The wet textiles were then dried. Time needed to soak, raise, spray, or coat textiles depended on the type of the textiles. For instance, when cotton nonwowen which had good water absorbency was used, the soaking time could be as short as one second; when synthetic fibers with poor absorbency such as rayon was used, the soaking time needed to be longer and may be longer than 30 seconds. Drying methods may be routine methods of the field. Drying was usually done at 50-250 C. Sunlight or UV irradiation may also be used.

The method invented here could control silver content on the textile, via controlling silver ion concentration in the high valence silver ion solutions. Silver content of textiles made with the invented method could be as high as 120 ug/cm2. Silver content was also determined by the type of the textile. For example, it depended on the tightness of the textile, or whether it was natural of synthetic textile.

Examples

The invention is further illustrated by the following examples.

Example 1

H4Ag2O6 solution was made according to the method from CN12214867A so that silver ion concentration in the obtained solution was 1000 ppm. A piece of cotton nonwowen (38g/m2) was soaked in the solution for 5 min at room temperature then taken out. The silver containing cotton was dried at 50 C. Silver content was determined to be 36.5 ug/cm2.

Example 2

Silver containing cotton nonwowen was made with the same process as in example 1. The concentration of H4Ag2O6 solution was 3000 ppm. Silver content was determined to be 75.8 ug/cm2.

Example 3

Silver containing cotton nonwowen was made with the same process as in example 1. The concentration of H4Ag2O6 solution was 4000 ppm. Silver content was determined to be 86.8 ug/cm2.

Example 4

H4Ag2O6 solution was made according to the method from CN1149389A so that silver ion concentration in the obtained solution was 500 ppm. A piece of cotton nonwowen was soaked in the solution for 30 seconds at room temperature then taken out. The silver containing cotton was dried at 50 C. Silver content was determined to be 16.7 ug/cm2.

Example 5

H4Ag2O6 solution was made according to the method from CN1149389A so that silver ion concentration in the obtained solution was 500 ppm. A piece of cotton nonwowen was raised in the solution for 1 min at room temperature then taken out. The silver containing cotton was dried at 50 C. Silver content was determined to be 17.0 ug/cm2.

Example 6

H4Ag2O6 solution was made according to the method from CN1149389A so that silver ion concentration in the obtained solution was 500 ppm. A piece of cotton nonwowen was raised in the solution for 5 min at room temperature then taken out. The silver containing cotton was dried at 50 C. Silver content was determined to be 17.6 ug/cm2.

Example 7-9

Silver containing cotton nonwowen was made with the same process as in example 4. The concentration of H4Ag2O6 solution was 50 ppm. The soaking time was 30 sc, 1 min, and 5 min, respectively. Silver content was determined to be 4.8, 5.1, and 5.5 ug/cm2, respectively.

Example 10-11

Silver containing cotton nonwowen was made with the same process as in example 1. The concentration of H4Ag2O6 solution was 20 ppm. The soaking time was 1 min and 5 min, respectively. Silver content was determined to be 2.3 and 2.6 ug/cm2, respectively.

Example 12

H4Ag2O6 solution was made according to the method from CN1149389A so that silver ion concentration in the obtained solution was 500 ppm. A piece of rayon nonwowen was soaked in the solution for 1 min at room temperature then taken out. After squeezing, it was dried at 170 C to obtain the silver containing rayon nonwowen Silver content was 18.2 ug/cm2.

Example 13

Same as example 5(?) except the rayon nonwowen was replaced with rayon/PET nonwowen. Silver content of the silver containing blend nonwowen was 18.2 ug/cm2.

Example 14

Same as example 5(?) except the cotton nonwowen was replaced with gauze. Silver content of the silver containing gauze was 8.5 ug/cm2

Example 15

Same as example 5. A piece of cotton nonwowen was soaked for 1 min in the solution and taken out. After squeezing, it was irradiated with light for 4 hr. The silver content was 16.1 ug/cm2.

Example

"Bacterial retarding rate" test was carried out using samples from example 1-12 and a control, according AATCC test method 100-1999. Bacteria used were staphylococcus. The rate was calculated with the formula

Bacterial retarding rate = [(C-A)/C]X100%

Where A was the bacteria count on silver containing samples after inoculation and 24 hr incubation; C was the bacteria count on the control sample at time zero after inoculation.

After 24 hr incubation, bacteria count on inoculated cotton control sample was 4.5 $x10^8$, while the count was 6.8×10^7 at time zero after inoculation. Table one lists the test results.

Table 1

Sample	Solution concentration(ppm)	Soaking time	Bacteria count	24 hr Retarding rate (%)
Cotton control at time zero			6.8×10^7	
Cotton control after 24 hr incubation			4.5×10^8	
Example 1	1000	5 min	36000	99.5
Example 2	3000	5 min	8000	99.99
Example 3	4000	5 min	346000	99.49
Example 4	500	30 sc	1420000	97.91
Example 5	500	1 min	60000	99.91
Example 6	500	5 min	0	100
Example 7	50	30 sc	110000	99.84
Example 8	50	1 min	686000	98.99
Example 9	50	5 min	0	100
Example 10	20	1 min	4000	>99.99
Example 11	20	5 min	22000	99.97
Example 12	500	1 min	97000	99.65
Example 13	500	1 min	4000	99.99

Example 14	500	1 min	4000	99.99
Example 15	500	1 min	4000	99.99

The above results demonstrated silver containing antimicrobial textile made with the method from this invention had good actimicrobial properties. There for in conclusion, the invented method can produce silver containing antimicrobial textiles.

Claims:

1. Applications of H4Ag2O6 solution in the manufacturing of silver containing antimicrobial textile.
2. Applications as described in claim 1, where said textile is knitted, weaved, nonwowen, yarns, or punctured membranes.
3. Applications as described in claim 1, where said textile are natural, synthetic, or the mixtures of them.
4. Applications as described in claim 3(??), where said natural textile are cotton, wool, linen, silk or the mixtures of them; where said synthetic textile include polyester, nylon, poly ethylene, and cellulose acetate or mixtures of them.
5. Applications as described in claim 1, where said textile is cotton nowowen.
6. Applications as described in claim 1, where said textile is gauze.
7. Applications as described in claim 1, where said textile are yarns.
8. Applications as described in claim 1, where said textile is punctured membrane.
9. A manufacturing method for silver containing textile. The method includes:
    a. Preparing solutions containing H4Ag2O6;
    b. Soaking, showering, spraying, or coating textile with obtained H4Ag2O6 solutions, and
    c. Drying the said textile.
10. The method as described in claim 8(**should be 9**), where concentrations of said H4Ag2O6 solutions are 1-5000 ppm.
11. The method as described in claim 8, where the drying temperature is 50-250C, trying time is 2-30 min.
12. The method as described in claim 8, where they trying may be done with sunlight or UV.
13. The method as described in claim 8, where said textile is knitted, weaved, nonwowen, yarns, or punctured membranes.
14. The method as described in claim 8, where said textile are natural, synthetic, or the mixtures of them.
15. The method as described in claim 13 (**8? Typo?**), where said natural textile are cotton, wool, linen, silk or the mixtures of them; where said synthetic textile include polyester, nylon, poly ethylene, and cellulose acetate or mixtures of them.
16. The method as described in claim 8, where said textile is cotton nowowen.
17. The method as described in claim 8, where said textile is gauze.
18. The method as described in claim 8, where said textile are yarns.
19. The method as described in claim 8, where said textile are punctured membranes.
20. A textile made with the method as described in claim 8.